In the Claims:

1.- 7. (Cancelled).

8. (NEW) A nonlinear precoding method based on modulo arithmetic for the transmit-side preequalization of K user signals to be transmitted in a digital broadcast channel with known transmission channel matrix H set up between a central transmitting station and K decentralized, non-interconnected receiving stations, the user signals consisting of data symbols ak with k from 1 to K from a signal constellation having Mk levels and a signal point spacing Ak with a periodic multiple representation of the undisturbedly-transmitted data symbols ak in data symbol intervals congruent for K receive-side modulo-decision devices, a transmit-power-minimizing selection of representatives v_k from the range of values $a_k+A_k \cdot M_k \cdot z_{kk}$, where z_{kk} is from the set of positive or negative integers including zero, and linear preequalization of the selected representatives v_k to form transmit signals x_k to be transmitted, comprising:

applying the nonlinear precoding method only to a reduced channel matrix H_{red} that is calculated from the equation $H = H_{red} R$, whereby H is the known channel matrix and R is a residual interference matrix R, whose interference elements are chosen to assume the range of values $A_k \cdot M_k z_{kl}$, where z_{lk} is from the set of positive or negative integers including zero.

9. (NEW) A nonlinear precoding method according to claim 8, wherein the matrixes F, B, and P for the nonlinear precoding of the reduced channel matrix H_{red} in the transmit-side are obtained by factorization of the reduced channel matrix H_{red} into a matrix F with orthogonal columns, a lower triangular matrix B and a permutation matrix P with the introduction of a receive-side scalar gain factor g according to:

$$P^T H_{red} = 1/g \; B \; F^{-1}.$$

10. (NEW) A nonlinear precoding method according to claim 9 or 10, wherein offset compensation is already carried out on the transmit signals Xk prior to transmission.